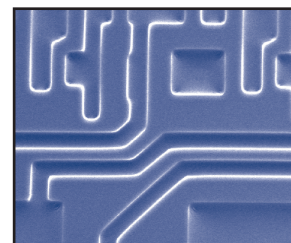
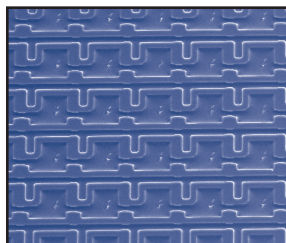
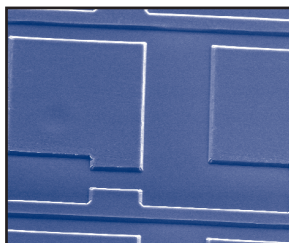
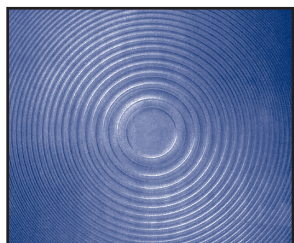


Imprint Lithography

Mastering and Replication Services



High Quality Replicated Nano-Imprint Templates

Benchmark Technologies provides end-to-end services in support of nano- and micro-imprinting projects. Among the services we provide:

CAD design services

- *Template floor planning and layout*

Template mastering with multiple mastering approaches

- *Stepper-based silicon masters*
- *Gaussian E-beam-based silicon and quartz masters*
- *Shaped E-beam-based quartz masters*

Replication of masters for working templates

- *Proven polymer-based replication process*
- *2nd or 3rd generation replicas*
- *Variety of materials and form factors available*
- *Useful for UV NIL, hot embossing or electroforming*



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www.benchmarktech.com

Replication Technology From



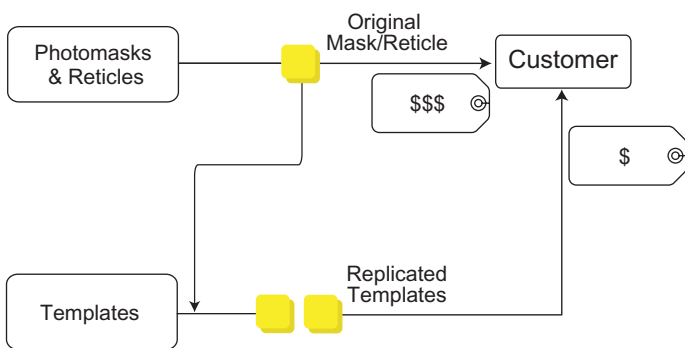
www.holographix.com

The Complete Solution for Replicated Nano-Imprint Templates

Benchmark Technologies and its fabrication partner, Holographix LLC, have teamed up to provide a complete solution for delivering replicated nano-imprint templates. Leveraging Holographix' proprietary polymer replication technology and Benchmark Technologies' broad experience in master patterning fabrication strategies, this combination provides for a single interface for pattern CAD, template layout, mastering and replication.

Imprint Templates

Imprint lithography has proven itself as a means for fabrication of nanostructures and continues to be investigated and adopted for a wide variety of applications including life sciences, data storage, opto-electronics and semiconductor. The Benchmark-Holographix team provides a unique combination of fabrication services to meet the growing needs of this customer base. Our replicated templates provide a lower cost alternative and reduce risk of damage associated with using the original template for nanofabrication.



Since 1987, Benchmark has supplied leading edge masks and reticles for advance optical lithography. Applying this experience to nano-imprint processes allows for quick and cost-effective convergence on the best solutions.

The combination of Benchmark Technologies' state-of-art mastering and Holographix' replication technology, make this team a world leader in precision nanostructure template fabrications.



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Master Fabrication

Benchmark Technologies can take your project from the concept stage through design and layout and implement the right technology for realizing the ideal master to feed the replication process.

We have broad experience in advanced patterning and can provide access for our customers to a variety of master fabrication technologies, including:

- Silicon-based masters using 193nm scanner lithography
- Silicon-based masters using Gaussian e-beam lithography
- Quartz-based masters using shaped e-beam lithography
- Quartz-based masters using Gaussian e-beam lithography

Replication Facilities

Production of high fidelity nanostructures requires a significant investment in capital equipment. Holographix' facility is equipped with:

- Class 1000 cleanroom space
- Custom UV replication labs
- March AP-1000™ plasma treatment system
- Denton Infinity 22® thin-film vacuum coating system
- Denton sputtering systems
- Zygo and ADE phaseshifting interferometers
- Cary 500 spectrophotometer

A complete listing of Holographix' equipment can be found on their website.

Company Experience

Since the mid-80s Holographix and Benchmark Technologies have been serving industry with cost-effective solutions for micro- and nano-patterning. With years of patterning know-how, this combination can make your imprint project successful and cost-effective with minimal delays.

Template Characteristics:

Feature resolution:	<10 nanometers
Maximum feature size:	100 microns
Optical transmission:	>99% from 420 nm to 2.2 μm
Temperature range:	-100° C to 200° C
Humidity range:	0 to 95% continuous
Chemical resistance:	impervious to degradation by solvent, acid, and alkaline environments

Replication Technology From

HOLOGRAPHIX® LLC

www.holographix.com